



What are Turbidity and pH?

Turbidity is the clarity of water expressed as nephelometric turbidity units (NTU's) and is measured with a calibrated turbidity meter (turbidimeter). The level of turbidity is determined by measuring the amount of light that passes through a standard sample of the water. pH is a measure of the acidity or basicity of a solution and is measured using a calibrated pH meter.

Code Authority:

The Clearing and Grading Code (BCC 23.76.160) permits the Development Services Department Director to require performance monitoring to determine compliance with State Surface Water Quality Standards (WAC 173.201A-200).

State Surface Water Quality Standards (WAC 173.201A-200).

The standard for turbidity is:

Not to exceed 5 NTU over upstream turbidity when upstream turbidity is 50 NTU or less;
and
Not to exceed 10% above upstream turbidity when upstream turbidity is greater than 50 NTU.

For construction turbidity monitoring, a turbidity benchmarks of 25 and 250 NTU are used. It is presumed that turbidity of 25 NTU or less is not likely to cause an exceedance of state water quality standards under most conditions, and BMPs are thought to be functioning well. Turbidity readings above 25 NTU indicate BMPs are not functioning properly, and action must be taken to correct problems. If the turbidity benchmark of 250 NTU is exceeded, there is a much higher risk of exceeding standards. In this event, immediate corrective actions must be taken, and Washington State Department of Ecology (Ecology) must be notified within 24 hours.

The standard range for pH is:

6.5 to 8.5 with a human caused variation within that range of less than 0.2 units.

The benchmark value for pH is 8.5 standard units. Any time sampling indicates that pH is 8.5 or greater, the high pH water (8.5 or above) must be prevented from entering the storm drainage system or surface waters, and, if necessary, the high pH water must be adjusted or neutralized.

Turbidity & pH Monitoring Plan Requirements:

An acceptable turbidity & pH monitoring plan will include the following elements:

1. Project Description – This section of the plan shall identify the purpose of the site clearing and grading, include a discussion of the extent of site disturbance required for the proposal, any proposed phasing of the project, the extent of concrete work, and/or cement treatment, and a brief description of the Temporary Erosion and Sediment Control (TESC) Plan.
2. Drainage Analysis – This section, at a minimum, shall include a discussion of: i) the general topography; ii) existing drainage patterns on-site including existing drainage features (i.e. wetlands, streams, ditches, catch basins, pipes, ponds etc.); and iii) location of protected areas (i.e. steep slopes, wetlands, riparian corridors and shorelines).
3. Monitoring Locations – Sampling is required at all discharge points where stormwater (or authorized non-stormwater) is discharged off-site, before it mixes with the storm drainage

system or receiving waters. All sampling point(s) shall be identified on the CSWPPP site plan and be clearly marked in the field with a flag, tape, paint, stake or other visible marker. Background turbidity and pH must be measured in the waterway that receives runoff from the sites(s) at a location up-gradient or outside the influence of discharge from the construction site. Background turbidity and pH must be measured each time discharge turbidity is measured.

4. Turbidity & pH Monitoring Data Sheet – Include in the monitoring plan an example data sheet to record daily monitoring data. An example Data Sheet is attached to these requirements, which may be used directly, or as a reference to develop a project specific data sheet. Project specific data sheets shall include all of the information on the example sheet, but may provide additional information.
5. Third Party Monitor - The plan must identify a qualified, professional monitoring company that will be responsible for providing turbidity & pH monitoring. The company may not be affiliated with any party with a vested interest in the project. The individual(s) who will be conducting the monitoring must be a certified erosion and sediment control lead (CESCL).
6. Field Testing Methods – Turbidity & pH monitoring equipment must be specified in the monitoring plan, and shall comply with the requirements of the EPA and provide immediate results in the field.
7. Frequency of Monitoring – During the Dry Season (May 1 – September 30) sampling shall be performed no less than one sample weekly. Additional samples shall be taken during or immediately after each rainfall event. No more than one sample will be required in a day if the test indicates that turbidity complies with allowable levels. If the test indicates that turbidity is in excess of the standard or turbid water is observed coming from the site after the initial sample is taken, additional samples may be required. Sampling during the Rainy Season (October 1 – April 30) must be done daily.
8. Reporting Requirements – Sampling data sheets shall be delivered, e-mailed, or faxed to the City of Bellevue Clearing and Grading Inspector the same day they are taken (e-mail address: clearandgradereview@bellevuewa.gov; FAX # (425) 452-7930). Delivery of data sheets must be arranged with the inspector prior to collection of the data.
9. Exceeding Turbidity Benchmarks – Upon determination of turbidity levels in excess of the 25 NTU benchmark (26 to 249 NTU); the CESCL must immediately notify the contractor. The contractor must make all necessary efforts to correct the condition(s) on site that is (are) causing, or contributing to, the excess turbidity. It is the responsibility of the contractor to determine the most appropriate measures and implement them immediately, although they may solicit input from the inspector, the CESCL, or any other outside resource. The CESCL must make the appropriate revisions to the CSWPPP

Upon determination that turbidity levels exceed the 250 NTU benchmark, the CESCL must immediately notify the contractor and the Clearing and Grading Inspector. The Clearing and Grading Inspector will forward the information to the Bellevue Clearing and Grading Supervisor who will notify Ecology within 24 hours. Immediate corrective actions must be taken by the contractor to correct the problems. The CESCL must continue to sample discharge daily until Turbidity is <25 NTU or the discharge is eliminated. The clearing and grading inspector has the authority to require additional TESC measures and/or issue a Stop Work order to mitigate water quality concerns.

10. Exceeding pH Benchmark - Any time sampling indicates that pH of discharge water is 8.5 or greater, the high pH water must be prevented from entering storm drainage system or surface waters. If necessary, adjust or neutralize the high pH water using an appropriate

treatment BMP such as CO₂ sparging or dry ice. Written approval from Ecology must be obtained before using any form of chemical treatment other than CO₂ sparging or dry ice.

11. Termination of Monitoring Services - Upon termination of monitoring services, the third party monitoring company shall submit a final report to the Clearing and Grading Inspector. The report shall indicate the reason for termination of services, a summary of turbidity and pH data obtained throughout the project, final turbidity and pH levels, and any outstanding issues that have not been fully addressed.

Turbidity & pH Monitoring Data Sheet

Project Name

Permit Number

Site Address

Name of CESCL

Phone Number

Name of Monitoring Company

Date & Time of Sample

Weather Conditions

Sampling Location	Turbidity Reading (NTU)	Turbidity Above Benchmark? (Y/N)	pH Reading	pH Above Benchmark? (Y/N)	Contractor Notified of results? (Y/N)

Corrective Measures Taken By Contractor (if turbidity increase is above standard):

Other Comments:
